

**CLAIMS AMENDMENTS AND CLAIMS LISTING:**

1. (Currently Amended) A method of fault classification in a plasma process chamber powered by an RF source, comprising the steps of:

a) running a plurality of ~~different~~ baseline processes of different types on the chamber,

(b) in respect of each said baseline process, determining the magnitudes of a plurality of Fourier components of delivered RF power and storing the magnitudes as reference data for that baseline process, and

c) when a fault is to be classified, repeating at least one of the said baseline ~~processes~~ process types according to a predetermined decision tree to classify the fault by comparing the current magnitudes of the said Fourier components with the corresponding reference data.

2. (Original) A method as claimed in claim 1, wherein steps (a) and (b) are performed prior to a production run, wherein the method further comprises monitoring the chamber for faults during the production run, and wherein step (c) is performed upon detection of a fault during the production run.

3. (Original) A method as claimed in claim 1, wherein steps

(a) and (b) are performed prior to scheduled downtime of the chamber and step (c) is performed after the scheduled downtime and prior to a production run.

4. (Currently Amended) A method as claimed in claim 1, wherein the ~~different~~ baseline processes of different types comprise a first baseline process including the same gases as those used in a production run for which the chamber is used, a second baseline process running an inert gas plasma, and a third baseline process running at sufficiently low power that no plasma ignites.

5. (Original) A method as claimed in claim 1, wherein the Fourier components are those of the voltage, current and phase of the delivered RF power.

6. (Original) A method as claimed in claim 1, wherein each baseline process is carried out on a test substrate.

7. (Original) A method as claimed in claim 1, wherein each baseline process is carried out on a product wafer.

8. (Original) A method as claimed in claim 1, wherein each baseline process is run in the absence of a substrate.

9. (Currently Amended) A method of comparing two plasma process chambers powered by an RF source, comprising the steps of:

a) running a plurality of ~~different~~ baseline processes of different types on one of the chambers,

b) in respect of each said baseline process, determining the magnitudes of a plurality of Fourier components of delivered RF power and storing the magnitudes as reference data for that baseline process,

c) running at least one of the said baseline ~~processes~~ process types on the other chamber according to a predetermined decision tree to classify any differences between the chambers by comparing the current magnitudes of the said Fourier components with the corresponding reference data.

10. (Currently Amended) A computer-readable storage medium bearing program code adapted ~~adapted~~ in execution on a computer to perform the following steps on a plasma process chamber powered by an RF source:

a) run a plurality of ~~different~~ baseline processes of different types on the chamber,

(b) in respect of each said baseline process, determine the magnitudes of a plurality of Fourier components of delivered RF power and store the magnitudes as reference data for that

baseline process, and

c) when a fault on the chamber is to be classified, repeat at least one of the said baseline ~~processes~~ process types according to a predetermined decision tree to classify the fault by comparing the current magnitudes of the said Fourier components with the corresponding reference data.